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dumb-bell eye-spots. Limbs gray, translucent, with the chitinous investment bluish black, hirsute, ending in pairs of double falcate unguis. Terminal joint of the palps ending in three minute uncinat denticles. Anal plates of the females usually with about 18 to 22 acetabula to each. Length of body 1.375 to 1.75 mm., breadth 1.125 to 1.5 mm. Inhabits the branchiæ and mantle of *Anodonta fluviatilis*.

The colors depend mainly on the contents shining through the transparent chitinous investment, which under reflected light exhibits a bluish-black tint. Commonly the black color is intense; and in alcoholic specimens the whole body is black. In several individuals the black passed into a chocolate hue. Dr. Bonz describes the European mite as black, with the median dorsal mark pale yellow; Pfeiffer as red-brown with a citron-yellow mark, and Beneden says it shows a Y in white, from which it was named.

The number of acetabula to the anal plates is variable; in one mite he found 23 to each plate, in a second 22 to each, in a third 22 to one and 17 to the other, and in a fourth 18 to one and 17 to the other. Claparede gives from 15 to 20 as the number to each plate in the European mite.

The variations of our mite, from the characters given of the European mite, are such as occur among individuals of either, and he therefore saw nothing distinguishing ours as a different species. Claparede describes another mite which infests the European Unios, which he distinguishes under the name of *Atax Bonzi*. The speaker had also observed a different mite, infesting the common mussel, *Unio complanatus*, of the Delaware River; of this mite he exhibited a drawing made in November, 1854. He suspected it to be the *Atax Bonzi*; but the question can only be more positively answered after the examination of certain details, which he hoped soon to have the opportunity of making.

If our two parasitic mites are identical with those of European mussels, it not only makes it appear probable that they are of common origin, but renders it the more probable that this is likewise the case with their hosts, even if these are not regarded of the same species.

Professor LEIDY also exhibited a collection of body-lice, *Pediculus vestimenti*, from Jews of Odessa, Russia, presented by Dr. A. G. Stratton. They range in size from 1.25 to 3.875 mm. in length, and appear in no respect to differ from those found on natives of our own country.

The Ice of the Glacial Period.—Professor HEILPRIN, referring to the subject of glaciation, stated that in his opinion the vast sheet of ice which is generally supposed to have covered during the great ice age a considerable portion of the northern regions of the European and North American continents, could not have had its origin, as is maintained by most geologists, in a polar "ice-cap,"

since it may reasonably be doubted whether there could ever have been formed in the extreme North an accumulation of snow and ice of a magnitude sufficient to propel southward a glacier, with an estimated thickness of several thousands of feet, to a distance of hundreds of miles, and up mountain slopes to heights equaling five or six thousand feet. The magnitude (as to height) to which such a snow accumulation may attain, will be dependent upon two conditions—(1), the quantity of aqueous (snow) precipitation, and (2), the upper limit in the atmosphere reached by clouds. It is well known that clouds, as a rule, rise highest in the regions of highest temperature—the equatorial—where the vapor absorption by the atmosphere is greatest, and where the planes of aqueous condensation are most distantly removed from the earth's surface; and, likewise, they rise higher in summer than in winter. The minimum rise will necessarily be in the extreme North (or South), and during the period of greatest cold, or winter. High (discharge) clouds are a rarity in the polar regions, and consequently precipitation will be mainly restricted to a comparatively low atmospheric zone. Above this zone, which will mark the upper limit of the "ice-cap," there can be but little snow accumulation. As a matter of fact, the officers of various Arctic expeditions have repeatedly noted that the high mountain-crests and elevations in the far North were frequently devoid of a snow covering, and that there was but very little precipitation, even over the low lands, during the winter, heavy precipitations setting in only with the spring months. The highest snow-clad elevation in the region of greatest cold (the West), in Greenland, appears to be Washington Land, with an estimated height of six thousand feet, which gives rise to the great Humboldt Glacier. Although this peak is completely buried under a mantle of snow (of undetermined thickness, however), it may yet safely be doubted whether snow of any great thickness (*unless under a much warmer climate*), could accumulate on a summit of much greater elevation. If not, this elevation, in the opinion of the speaker, was entirely inadequate to account for the southward propulsion of a glacier to the extent required by geologists.

Professor LEWIS remarked that notwithstanding the difficulties in a theoretical explanation, the fact of a great continuous glacier at the time of maximum glaciation seemed clearly indicated, at least in America, by the numerous observations recently made. He described the extent of the glacier in America, as indicated by its terminal moraine, and stated that the close similarity of its phenomena at distant portions of its southern edge indicated a continuous ice-sheet. The continuous motion of its upper portion is shown by the uniform direction of glacial striæ upon elevated points. Thus the S. W. direction of the striæ upon the mountain tops of N. E. Penna., was identical with that upon the Overlook Mountain of the Catskills, and of that upon the summits of the Laurentians of Canada. The striæ at lower elevations conformed more or less to the valleys, and did not indicate the general move-

ment of the ice. The thickness of the glacier increased northward, the rate of increase diminishing as its source is approached. This latter point has not heretofore been appreciated, although observed some time ago by Dr. Hayes in the case of the Greenland glacier.

Recent observations by the speaker in Pennsylvania had shown the glacier to be 800 feet thick at a point five miles north of its extreme southern edge, and 2000 feet thick at a point eight miles from its edge, while it was only about 3100 feet thick one hundred miles farther northeast, and about 5000 feet thick three hundred miles back from its edge. The amount of erosion caused by it upon rock surfaces was in some degree a measure of its thickness, being far greater in Canada, even upon the hard Laurentian granites of that region, than in Pennsylvania, where even soft and friable rocks were but slightly eroded.

The present thickness of the glacier in central Greenland was considered, and the magnitude of certain icebergs detached from it was given. A friend of the speaker had, within a few months, seen a floating iceberg near the coast of Newfoundland, which stood 800 feet above the water by measurement, and may have been therefore nearly a mile in depth. Dr. Hayes saw an iceberg aground in water nearly half a mile deep.

That the great glacier flowed up steep inclines was abundantly proven by recent observations of the speaker in Pennsylvania. He instanced the striæ covering the north flank of the Kittatinny Mountain, and a boulder of limestone perched on the summit which, within a distance of three miles, had been carried up 800 feet vertically.

Referring to a paper recently published by Mr. W. J. McGee, who found difficulties similar to those of Professor Heilprin in the assumption of a polar ice-cap of great thickness, and who imagined the glacier to increase by additions to its outer rim, the speaker held that the single fact of the transportation by the glacier of far-traveled boulders to its terminal moraine, was a fatal objection to any such hypothesis.

Nor did he believe that the hypothesis adopted by Professor Dana and others, of a great elevation of land in the North, was a probable one. The facts now in the possession of geologists do not indicate such a great and local upheaval as required by that hypothesis.

An explanation, therefore, must still be sought for the southward flow of a continuous ice-sheet - a flow in some regions up-hill. The action of gravity was certainly not sufficient. Even in the case of the downward flow of the steeply inclined Swiss glaciers, it had been shown that gravity was more than counterbalanced by friction of the sides and bottom, and that these glaciers moved by reason of an inherent moving power of the molecules of the ice. It was probable that similar action occurred in the great continental glacier.

He suggested, therefore, a hypothesis which, while preserving

the unity of the glacier, as indicated by observed facts, neither assumed an unreasonable land elevation in polar regions, nor required a thickness of ice so great as to be open to the objections of the last speaker.

He suggested that the ice-cap flowed south simply because it flowed toward a source of heat. Such flow does not depend upon gravity, but would occur in a nearly flat field of ice, and he thought that the ice need not to have been more than a few times its present thickness in Greenland to account for all existing phenomena upon the hypothesis now suggested.

Professor HEILPRIN maintained that we were unacquainted with any laws of glacial action which would account for the indiscriminate progression of an ice-sheet toward a source of heat. The molecular-expansion theory as applied to the glacial phenomena of the Alps, took no cognizance of the position of the heat power, but merely of that of least resistance (the direction of slope). As to the magnitude of icebergs, the height above water gave no positive indication as to the development (in depth) beneath the surface, since this would largely depend upon the form assumed by the berg. As a matter of fact, however, the highest bergs observed by Hayes and Nares in the northern regions, rose only about 300 ft. out of the water, a height somewhat exceeding the highest Antarctic bergs encountered by the "Challenger." We had, therefore, no indications of any extraordinary development of ice in Greenland.

Chalcedony containing Liquid.—Professor H. GARVILL LEWIS called attention to a geode of chalcedony from the Salto River, Uruguay, presented by Mr. S. R. Colbourn, of the United States Navy. The specimen contained an unusual quantity of liquid—from two to three drachms; it was derived from an extensive basaltic formation of amygdaloid and black melaphyr, and was coated with a substance resembling asbestos. He described the method of formation of such hollow masses of mammillary chalcedony as being endogenous and referred to an interesting paper recently published by I. Anson and Parkhurst upon the artificial manufacture of chalcedony.

On the Flowering of the Stapelia.—At the meeting of the Botanical Section, February 12th, Mr. THOMAS MEEHAN exhibited specimens of *Stapelia bufonia* in various stages of growth, inflorescence and fruit, and pointed out that though there were axillary buds of more or less prominence at the base of what we had to call leaves, yet the flowers rarely proceeded from these, but from lateral accessory buds. When the axillary buds developed, they produced branches and not flowers. The lateral accessory buds usually developed into minute abortive flowers, with a membranous scale or bract in the place of the primary leaf. These observations were made on plants which had been planted in the open ground